

<b>FACILITY</b>		<b>PR#:</b>
<b>PROJECT</b>		
<b>ADDRESS</b>		

**ELECTRICAL REQUIREMENTS**  
**OAR 333-535-0310**  
Effective October 1, 2009

\_\_\_ Schematic Design (SD) Review    \_\_\_ Construction Document (CD) Review

REF OAR RULE SECTION	COMPLIED?		COMMENT
	YES	NO	
<b>(1)General:</b>			
(a) All material including equipment, conductors, controls, and signaling devices shall be installed in compliance with Oregon Structural Specialty Code (OSSC), the Oregon Electrical Specialty Code (OESC), and NFPA 99 Health Care Facilities. All materials shall be listed as complying with state approved standards;			
(b) The electrical installations including, but not limited to, alarm, nurses' call, communication, and emergency generator systems shall be tested to demonstrate that equipment installation and operation is as intended and appropriate. A written record of performance tests of special electrical systems and equipment shall show compliance with applicable codes and standards. Grounding continuity, receptacles and isolated power systems shall be tested as described in NFPA 99;			
(c) Functional performance tests shall be provided for projects that include the addition or modification of major equipment and systems. These tests shall be performed to ensure electrical systems operate in accordance with the design intent and in compliance with requirements herein. Description of procedures and test results for each functional performance test shall be documented to demonstrate to the design engineer, or his or her representative, that systems operate in accordance with the design intent. Documentation shall be included in the maintenance files and be available for inspection by the Division's surveyors or Authorities having Jurisdiction. Functional performance tests shall be developed and performed for the following systems and system functions in inpatient facilities where applicable:			
(A) Emergency power systems;			
(B) Generator fuel oil supply transfer systems including alarms;			
(C) Fire alarm systems;			
(D) Nurse call systems;			
(E) Communication systems;			
(F) Grounding systems;			
(G) Isolated power systems;			
(H) Receptacle continuity and grounding system tests; and			
(I) Emergency power system load shedding controls.			

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	YES	NO	
(d) When remodels occur in hospitals in which emergency electrical services branches are not divided in accordance with NFPA 99 and OESC, and less than 50 percent of an individual system is affected, the entire system is not required to be made to conform to these codes. Modifications, however, shall be done in a manner to minimize required work should the full system later be brought into conformance;			
(e) Upon completion of the electrical contract, the owner shall be furnished, and shall retain on file, a complete set of building drawings, a complete set of operating, maintenance, and preventative maintenance instructions, parts lists, and procurement information for all major electrical equipment and systems, including electrical distribution, equipment, generators, nurse call equipment, smoke detection equipment, alarm systems, and arc flash labeling. Responsible operating staff shall be provided with instructions in the proper operational use of system, equipment, and controls. This information shall be available for inspection by the Division's surveyors or Authorities having Jurisdiction.			
(f) Psychiatric patient room fixtures and equipment shall be tamper resistant and shall be selected to meet the requirements of the Patient and Staff Safety Assessment. Refer to OAR 333-535-0061 for additional requirements. Equipment shall be selected to minimize the need for maintenance within the room.			
<b>(2) Switchboards, power panels, equipment and their installation:</b>			
Switchboards, power panels, equipment and their installation shall comply with OESC. The normal power main switchboard shall be located in an area separate from the essential electrical system equipment; in an area separate from plumbing and mechanical equipment, except equipment required to support electrical equipment; and in an area accessible only to authorized persons.			
<b>(3) Panelboards:</b>			
Panelboards serving normal lighting and appliance and all critical care circuits shall be located on the same floor as the circuits they serve. Panelboards for life safety circuits may serve no more than one floor above and/or below, and the floor on which they are located. Provide labeling at fixed, major electrical equipment served by the equipment branch indicating the panel designation. New panelboards, serving patient care areas, shall not be located in corridors accessible to the general public.			
<b>(4) Lighting:</b>			
(a) Lighting shall conform to the recommended lighting standards for public buildings contained in the OSSC (Mean of Egress Illumination), Illuminating Engineering Society (IES) RP-28 and RP-29. Approaches to buildings and parking lots, and all occupied spaces within buildings shall have illuminated fixtures as necessary.			
(b) Approaches to buildings and parking lots shall have lighting at a minimum of 1 foot-candle to allow for the safe passage of pedestrians.			

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	YES	NO	
(c) Inpatients' rooms shall have general illumination, night illumination, reading illumination and exam illumination.			
(A) General illumination fixtures shall be provided in each inpatient room. At least one fixture shall be connected to the emergency power system, critical branch.			
(B) Night illumination fixtures shall be provided in each inpatient room to light the pathway from the room entrance to the bed and from the bed to the toilet. The night illumination fixture(s) shall be permanently installed low-intensity luminaries mounted at or below the patient bed level. Night luminaries shall be controlled at the room entrance.			
(C) Reading illumination fixtures shall be provided for each patient. The patient shall be able to control the reading light without getting out of bed. Flexible light arms, if provided, shall be mechanically controlled to prevent the bulb from coming in contact with bed linen.			
(D) Exam illumination fixtures and all lights positioned over the patient bed shall be designed or positioned to prevent damage from intravenous (IV) poles and traction devices when the head of the bed is raised.			
(d) All light controls in patient areas shall be of the quiet operating type.			
(e) Lighting for intensive care, critical care, and newborn nursery bed and crib areas shall be designed or arranged to permit staff observation of patients, but minimize glare, i.e., no down lights over patient bed areas. Provisions shall be made to allow staff to lower the light levels through switching of alternate lamps or by dimming the lighting. Refer to OAR 333-535-0041(6) (h) for lighting controls required at NICU beds.			
(f) Operating and C-section delivery rooms shall have general lighting in addition to that provided by special luminaires at the surgical and obstetrical tables. Each fixed special luminaire at the table shall be connected to an independent circuit. Portable units may share circuits.			
(g) Patient care unit corridors shall have general illumination with provisions for reduction of light level at night.			
(h) Non-lensed fixtures shall not be allowed in patient care areas.			
(i) Adaptable or universal rooms shall be in accordance with the most restrictive use.			
<b>(5) Receptacles (Convenience Outlets):</b> See Table 6 for receptacle requirements in specific areas.			
(a) In pediatric units, psychiatric units, emergency department waiting areas, and outpatient waiting areas receptacles shall be tamper resistant, hospital grade, safety grounding type;			
(b) Anesthetizing locations. Each operating and C-section delivery room shall have a minimum of six independent circuits serving receptacles. Where mobile X-ray equipment requiring special electrical considerations is used, additional receptacles distinctively marked for X-ray use shall be provided. (See OESC, for receptacle requirements when capacitive discharge or battery operated mobile X-ray units are used.);			

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(c) Patient areas. Each patient room shall have duplex grounding type receptacles located as follows: One on each side of the head of each bed, at least one of which shall be connected to the emergency electrical system critical branch; one for the motorized bed; and one on each other wall. A separate receptacle shall be provided for television, if used. Receptacles may be omitted from exterior walls where construction would make installation impractical. Adaptable or universal rooms shall be in accordance with the most restrictive use.			
(d) All critical care areas, as defined in OESC and NFPA 99, including pediatric intensive care, trauma, and resuscitation, shall have at least four duplex outlets within 6 feet of the head of each bed, crib, or bassinet, all of which shall be connected to the emergency electrical system critical branch. Additional outlets (which may be shared) shall be available at the head of each bed;			
(e) Resuscitation, LDRP, and LDR rooms shall have receptacles at the bed as required for patient rooms and shall have additional receptacles at the crib/bassinet as required for normal newborn nurseries.			
(f) Patient areas with renal dialysis water and waste connections shall be provided with GFI protection.			
(g) Corridors. Duplex grounded receptacles for general use shall be installed approximately 50 feet apart in all corridors and within 25 feet of the ends of corridors. Receptacles in pediatric unit corridors shall be hospital grade, tamper resistant, safety grounding type. At least one single polarized receptacle marked for use of X-ray only shall be installed in corridors of inpatient areas. Where capacitive discharge or battery-powered X-ray units are used in lieu of the portable electrically powered type, separate polarized receptacles are not required.			
(h) Provide duplex outlets for emergency resuscitation carts, connected to the critical branch of the emergency system.			
<b>(6) Equipment Installation in Special Areas:</b>			
(a) Anesthetizing locations. All electrical equipment and devices, receptacles and wiring shall comply with applicable sections of NFPA 99 and OESC.			
(b) X-ray installation. Fixed and mobile X-ray equipment installations shall conform to OESC.			
(c) Ground fault protection for personnel shall be provided as follows:			
(A) Individual 125 volt ground fault circuit interrupter receptacles shall be provided when located adjacent to any sink within 6 feet of any shower or tub; and			
(B) Ground fault circuit interrupter protection shall be provided for all 15 or 20 amp, 125 volt receptacles located within 6 feet of kitchen or other food preparation area sinks; and			
(C) When ground fault circuit interrupters are used in critical care areas, provisions shall be made to ensure that other essential equipment is not affected by activation of an interrupter.			

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(d) In inpatient care areas, electronic faucets and water closets requiring electricity to operate shall be connected to the critical or equipment branch of the emergency system.			
(e) Domestic hot water systems in inpatient facilities shall be served by the equipment branch of the emergency system and a minimum of one kitchen refrigerator and one kitchen freezer shall be served by the equipment branch of the emergency system.			
(f) All patient care-related telecommunications and information systems shall be powered from the essential electrical system. If installed, electronic surveillance systems including patient location, video/audio monitoring, and infant abduction prevention systems shall be served by the essential electrical system.			
<b>(7) Nurses' Call system requirements for inpatient facilities and outpatient surgical facilities:</b>			
(a) General. Each patient room including diagnostic and treatment areas shall be served by at least one calling station for two-way voice communication, except as exempted elsewhere in this chapter. Each such bed shall be provided with a call button. Two call buttons serving adjacent beds may be served by one calling station. Calls shall activate a visible signal in the corridor at the doors to patient's rooms and in all nurses' work stations including clean utility rooms, soiled utility rooms, medication rooms, and the nursing station of the nursing unit. In multi-corridor nursing units, additional visible signals shall be installed at corridor intersections. All nurses' call stations shall be electronically supervised to indicate when connecting devices are inoperable. Nurses' calling systems that provide two-way voice communication shall be equipped with an indicating light at each calling station that lights and remains lighted as long as the voice circuit is operating.			
(b) Emergency call system. A nurses' call emergency system shall be provided for each inpatient toilet, bath, sitz bath, shower room, imaging suite, and renal dialysis toilet room, except as exempted elsewhere in this chapter. This system shall be usable by a collapsed patient lying on the floor. Inclusion of a pull cord will satisfy this standard. The emergency call system shall be designed so that all signal lights will remain lighted until turned off at the patient's calling station. Provisions for emergency calls will also be needed in outpatient and treatment areas where patients may be subject to incapacitation, such as dressing areas and restrooms.			
(c) Intensive care. In areas such as intensive care, recovery and pre-op where patients are under constant visual surveillance, the nurses' call system may be limited to a bedside button or station that activates a signal readily seen from the control station.			

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(d) Nurses' emergency. A calling station that may be used by nurses to summon assistance from other areas for non-life threatening situations shall be provided in each C-section, recovery, emergency examination or treatment area, and in intensive care units, nurseries, special procedure rooms, stress test areas, cardiac catheterization, out-patient surgeries, special procedure rooms, endoscopy, colonoscopy, bronchoscopy, emergency department triage/intake areas, and group areas for psychiatric patients. The call station may be located at the area nurse station in intensive care, nursery, recovery, and emergency department areas. This system shall activate a visual and audible signal at all nurse work areas in the unit and at an additional nurse station in a staffed area.			
(e) In critical care, post anesthesia care unit recovery, and inpatient pre-op areas the nurse call system shall include provisions for an emergency code resuscitation alarm to summon assistance from outside the unit.			
(f) Each operating room shall be provided with a system for emergency communication with the surgical control station that can be operated without the use of the hands, but which is not foot operated. (Refer to OAR 333-535-0110 (3)-(a))			
(g) In non-invasive and non-critical care areas with CCTV and intercom to monitor the patient, such as radiation therapy and tomotherapy, a patient call station is not required.			
(h) Nurse call stations are not required in psychiatric patient care rooms, but if provided, all hardware shall have tamper resistant fasteners and provisions shall be made for the easy removal or covering of call button outlets.			
<b>(8) Emergency Electric Service:</b>			
(a) General. An emergency source of electricity shall be provided and connected to certain circuits for lighting and power during an interruption of the normal electric supply in accordance with NFPA 99, NFPA 110, and OESC.			
(b) Emergency electric services shall be provided to all services that must continue to function during any failure of the normal power source as required in NFPA 99 and OESC, including fire pump if installed. Sufficient fuel/power to operate the emergency services for a minimum of 96 hours shall be provided for inpatient facilities. The fuel system shall include a low level day tank alarm, transfer pump flow switch alarm, or other method to detect an interruption of flow between the main fuel tank and the day tank.			
(c) Exhaust systems for internal combustion engines shall be of the critical silencer type and be installed to minimize objectionable noise to patient areas. Where a generator is routinely used for reduction of peak loads, protection of patient areas from excessive noise may become critical.			
(d) Electrical plans shall include information indicating size of essential electrical service and load served by automatic transfer switch(es). Plans or specifications for facilities utilizing only one transfer switch shall include load calculation summaries showing the volt amp loads on the transfer switch.			

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<b>(9) Fire Alarm Systems:</b>			
All health care facilities shall be provided with fire alarm systems in accordance with the Authorities having Jurisdiction. Special attention shall be given to the use of fire alarm appurtenances in anesthetizing locations and control of air handling systems serving anesthetizing and infections isolation areas.			